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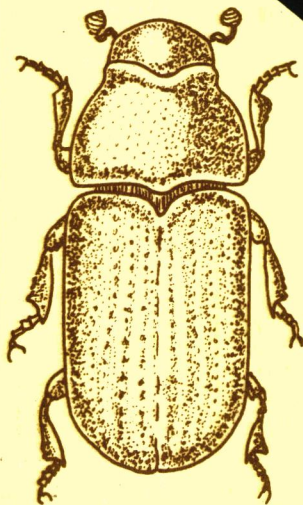
TECHNICAL REPORT

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SIMULATED YIELD TABLES FOR DWARF
MISTLETOE MANAGEMENT IN PONDEROSA
PINE STANDS (SWYLD2 PROGRAM)

Cuba and Jemez Ranger
Districts
Santa Fe National Forest
New Mexico

1976



Southwestern Region

U. S. DEPARTMENT OF AGRICULTURE

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TECHNICAL REPORT

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MANAGEMENT IN PONDEROSA PINE STANDS (SWYLD2 PROGRAM)

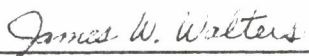
PHASE I. YIELD TABLE SYNTHESIS:
AN AID TO SILVICULTURAL PRESCRIPTIONS

Cuba and Jemez Ranger Districts
Santa Fe National Forest
New Mexico

April 1976

Forest Insect and Disease Management
State and Private Forestry
Southwestern Region, Forest Service, USDA
517 Gold Avenue, SW
Albuquerque, New Mexico 87102

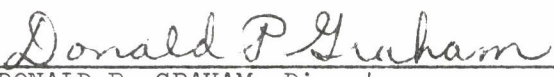
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INTRODUCTION

Southwestern dwarf mistletoe (Arceuthobium vaginatum subsp. cryptopodum) is the most destructive forest disease in the Southwest. This disease causes growth loss, deformity, mortality, and reduced seed production in infected trees. Timber volume yield is reduced in dwarf mistletoe-infested stands proportionate to the level of infestation. Cultural treatments of mistletoe-infested stands often allow near-maximum volume production to be realized. Silvicultural operations such as precommercial and commercial thinning are accepted methods of reducing adverse effects caused by dwarf mistletoe infestation. In young, even-aged ponderosa pine stands, suppression of dwarf mistletoe can generally be accomplished most efficiently when standard silvicultural thinning, as outlined in FSM 2476, is followed.

The timber volume reduction caused by dwarf mistletoe in an infested stand is difficult to assess by direct observation. Also, management alternatives that reduce dwarf mistletoe impact vary in their effectiveness. Researchers have developed a simulated yield program (SWYLD2) for use in even-aged and two-storied ponderosa pine stands (Myers, Edminster, and Hawksworth 1975). This program can be used in either dwarf mistletoe-infested or non-infested stands. The program aids the land manager by quantifying effects of dwarf mistletoe and effects of various silvicultural treatments on a mistletoe infestation. Yield tables generated by the program help the land manager evaluate management alternatives through examination of yields produced under such alternatives.

The SWYLD2 program is being evaluated for implementation in the Southwestern Region. Areas were selected in various parts of the Region for development of simulated yield tables in mistletoe-infested stands. The program for implementation of SWYLD2 consists of three phases: I. synthesis of yield tables for selected stands infested with dwarf mistletoe, II. evaluation of these stands managed with the aid of SWYLD2 simulations, and III. implementation of SWYLD2 in timber management programs of the Southwestern Region. This report is one of a series to be issued during the implementation process.

OBJECTIVE

The purpose of this project was to synthesize yield tables for even-aged, dwarf mistletoe-infested ponderosa pine stands on Cuba and Jemez Ranger Districts, Santa Fe National Forest. This report summarizes results for Phase I of the SWYLD2 implementation program on this Forest.

PROCEDURE

The following procedure constituted Phase I of this project:

1. Collect data necessary for input in the SWYLD2 program from two even-aged, dwarf mistletoe-infested ponderosa pine stands on Cuba and Jemez Ranger Districts.
2. Combine data with various management alternatives selected by the land manager and produce simulated yield tables for the sampled stand.
3. Assist land manager in interpreting the yield tables and selecting the best combination of management alternatives in a dwarf mistletoe-infested stand.
4. Assist land manager in planning implementation of selected management alternatives.

METHODS

Two stands of even-aged ponderosa pine infested with dwarf mistletoe were sampled in 1975 by personnel from the Forest Insect and Disease Management Staff Unit (Fig. 1 and 2). To facilitate understanding of the SWYLD2 program, even-aged stands were sampled because use of two-storied stands could double the number of management alternatives considered. Widely scattered overstory trees were present in the stands; however, they were not sampled because of their small numbers.

Sampling Procedure

1. The boundary of the area was marked.
2. Age measurements were obtained from 20 ponderosa pine trees representative of the average stand age.
3. Site index measurements were obtained from 12 dominant ponderosa pines within the area sampled.
4. Sample plots were located at 4-chain intervals along parallel compass lines 4 chains apart; the plots were of variable size with a maximum radius of 33 feet; each plot was divided into four quadrants by the intersection of a base line at right angles to the compass line; the third nearest live ponderosa pine tree (4.5 feet or taller) to plot center in each quadrant was sampled; distance from plot center to the third tree, d.b.h., and presence or absence of dwarf mistletoe were recorded for each "sample tree."^{1/}

^{1/} A blackjack, 4.5 feet or taller, the third nearest live tree in the sample quadrant, and within 33 feet of plot center.

5. Survey data were first processed through the DENSUR computer program, which summarized field data and provided estimates of average tree density, average d.b.h., and percent of trees infected with dwarf mistletoe; the summarized data were combined with management alternatives obtained from Ranger District personnel and then processed through the simulated yield program SWYLD2.

RESULTS AND DISCUSSION

Results for each of the two areas are presented separately herein.

Cuba Ranger District

A 142-acre stand of even-aged ponderosa pine on the Cuba Ranger District was sampled by collecting data on 89 plots. Area sampled, line, plot, and dwarf mistletoe distribution are indicated in Figure 3. Plots with dwarf mistletoe had at least one infected sample tree. Plots with less than two sample trees were considered understocked and were not used in the data analysis. Deletion of these plots provided a more precise estimate of density (than when they were included) for the stand to be thinned. Summation of survey results:

Site index	89
Average age	52
Average number of trees/acre	560
Average d.b.h. (inches)	5.1
Percent trees infected with dwarf mistletoe	27

This basic stand information was combined with management alternatives selected by Ranger District personnel to produce 22 simulated yield tables. The yield tables were discussed and evaluated with Ranger District personnel. Six yield tables were selected as examples in this report (Tables 1-6). Several important concepts are revealed by comparing the six yield tables. Total board foot volumes were reduced (Tables 2 and 6) from maximum (Table 1) when the initial stand entry was delayed either 10 or 20 years. Volume reduction resulted from a buildup of dwarf mistletoe which could not be controlled by successive entries in the stand. Other alternatives resulting in reduced per acre volumes were variation in thinning intensity and cutting cycle (Tables 3, 4, and 5). By close examination of the yield tables, land managers can select the combination of management alternatives that best meet current management objectives.

Jemez Ranger District

A 394-acre stand of even-aged ponderosa pine on the Jemez Ranger District was sampled by collecting data on 246 plots. Preliminary

examination of the basic stand information indicated a wide variation in tree density between two portions of the sampled area. Due to this density variation, the stand was divided into two parts. Results from one part of the original stand are included in this report. Changes in management objectives for the remainder of the stand preclude its inclusion at this time. A 230-acre portion of the original area was sampled by using data from 144 plots within the stand (Fig. 4).
 Summation of survey results:

Site index	76
Average age	41
Average number of trees/acre	2,947
Average d.b.h. (inches)	3.1
Percent trees infected with dwarf mistletoe	14

This basic stand information was combined with management alternatives selected by Ranger District personnel and produced 41 simulated yield tables (generally, fewer tables will be produced). All yield tables were discussed and evaluated with Ranger District personnel. Seven yield tables were selected as examples in this report (Table 7-13). Table 7-11 simulate a 140-year rotation, while Tables 12 and 13 are based on a 120-year rotation. All seven yield tables indicated dwarf mistletoe was controlled; however, mistletoe levels were somewhat higher when a 30-year cutting cycle was simulated (Table 11). Variation in total volume production per acre resulted from simulating different thinning intensities, cutting cycles, and rotation ages. The yield tables will aid land managers in selecting management alternatives that best meet current management objectives.

CONCLUSIONS AND RECOMMENDATIONS

Sufficient stand data were obtained on the Cuba and Jemez Ranger Districts for use in the simulated yield program SWYLD2. The data were combined with various management alternatives selected by Ranger District personnel, and yield tables were produced for each sample area. Examination of yield tables by the land manager and personnel from the Forest Insect and Disease Management Staff Unit revealed several important factors: (1) volume losses caused by dwarf mistletoe can be substantial when infested stands are improperly treated (FSM 5200); (2) control of dwarf mistletoe is dependent on management alternatives selected for use in a particular area; (3) total volume production per acre is dependent on management alternatives selected for use in a particular area.

The simulated yield program SWYLD2 is a potentially useful tool for land managers. The limits of this program will be revealed after on-the-ground situations in which simulated yield information has been used are compared with their simulated yields.

Based on results of this report, the following plan of action is recommended for the areas sampled on Cuba and Jemez Ranger Districts:

1. Select the yield table and accompanying management alternatives that best meet current management objectives, while reducing dwarf mistletoe to acceptable levels (FSM 5260).
2. Implement the management alternatives selected for the first stand entry.
3. At the time of initial stand entry, or within 5 years thereafter, remove all mistletoe-infected overstory trees from the treated area.
4. With the assistance of personnel from the Forest Insect and Disease Management Staff Unit, complete a post-treatment evaluation of the area.
5. Compare results of the post-treatment evaluation with simulated yield predictions (Phase II).

Instructions for use of the SWYLD2 program and detailed descriptions of management alternatives are provided by Edminster and Hawksworth (1975). Additional information pertaining to the SWYLD2 program may be obtained by contacting the Forest Insect and Disease Management Staff Unit.

LITERATURE CITED

- Edminster, C. B., and F. G. Hawksworth. 1975. User's guide to SWYLD2: yield tables for even-aged and two-storied stands of southwestern ponderosa pine, including effects of dwarf mistletoe. In press.
- Myers, C. A., C. B. Edminster, and F. G. Hawksworth. 1975. Yield tables for even-aged and two-storied stands of southwestern ponderosa pine, including effects of dwarf mistletoe. In press.

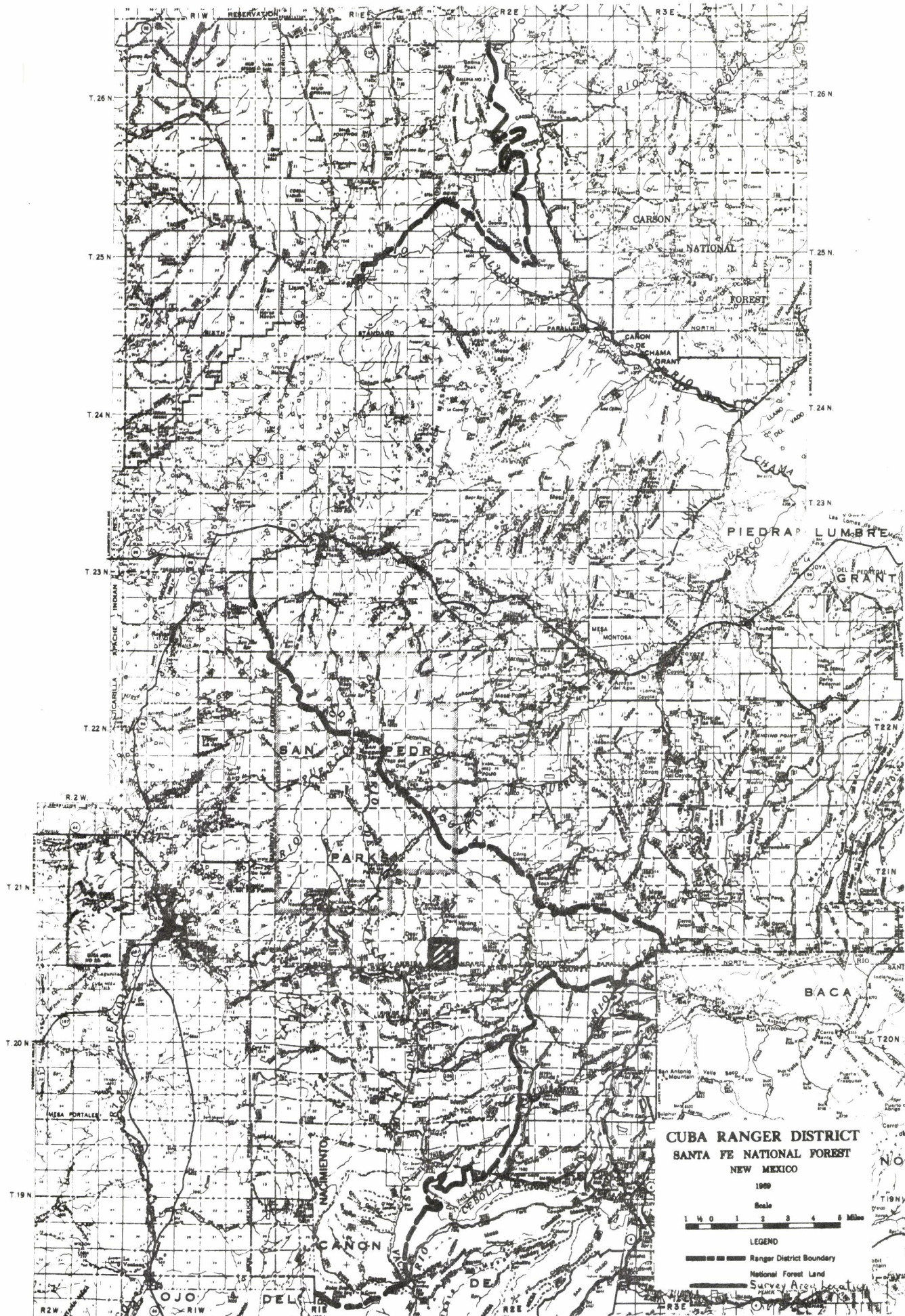


Figure 1

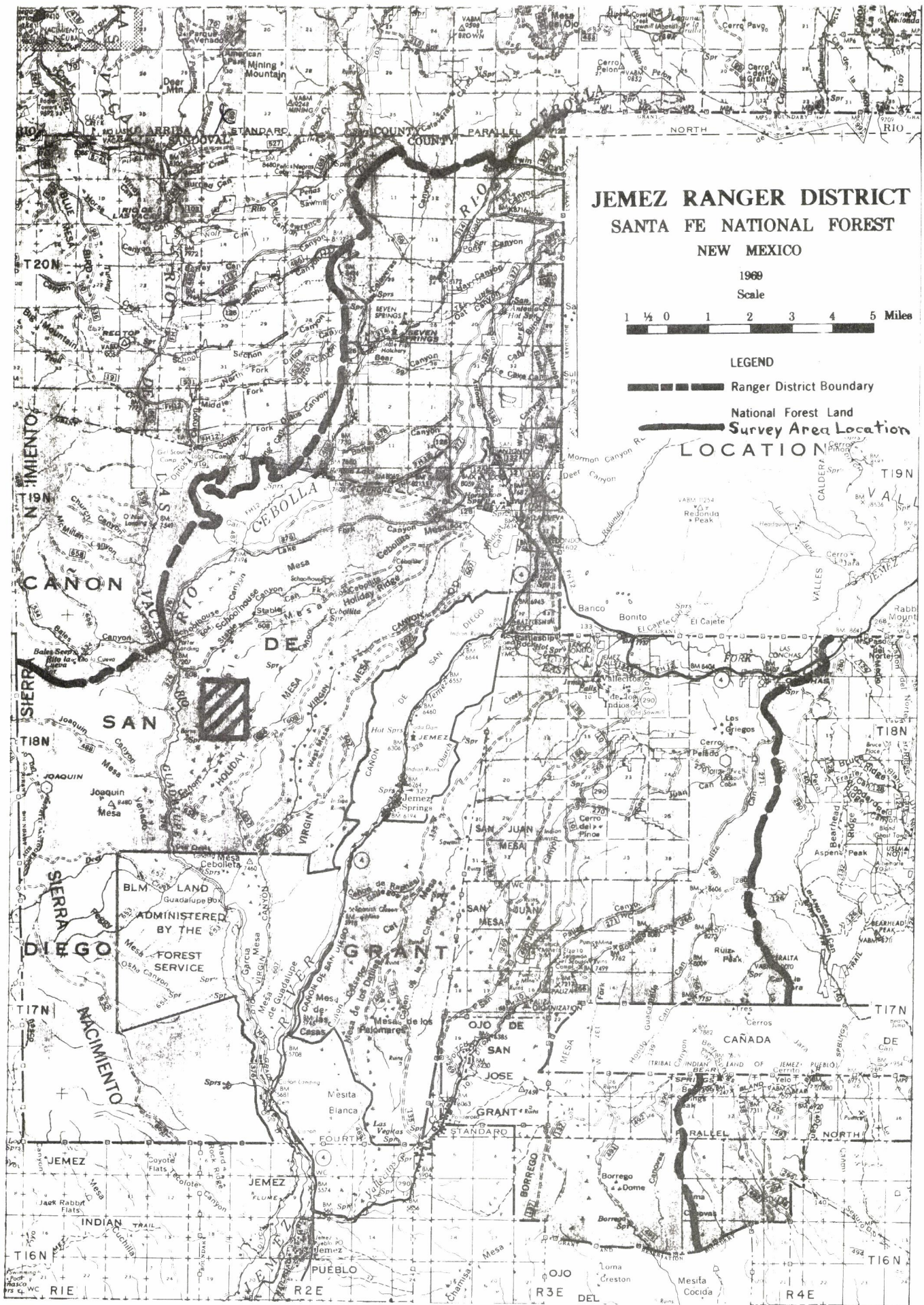
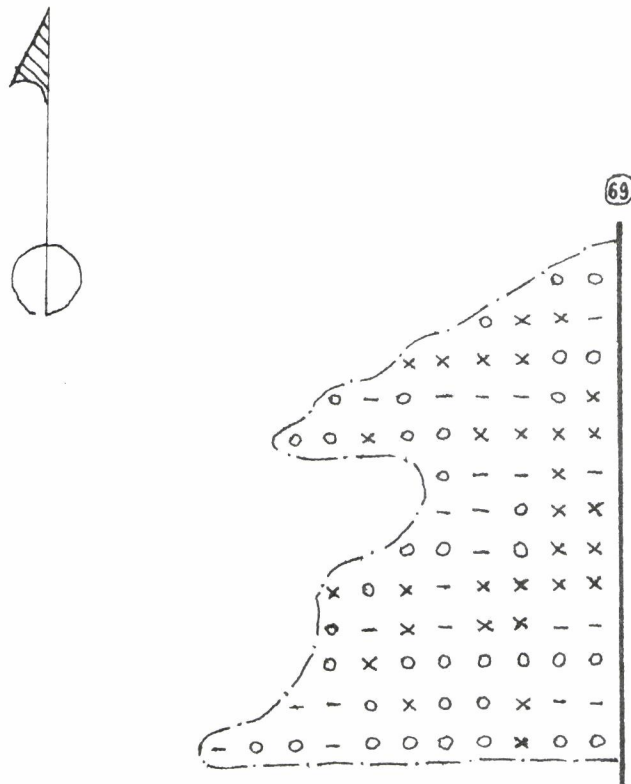


Figure 2

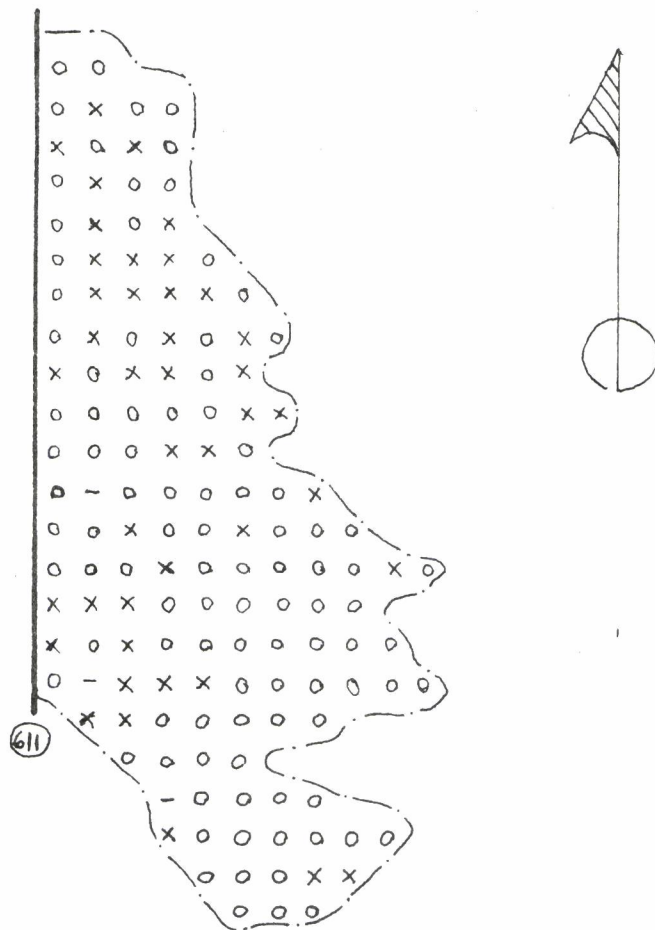


89 plots
142 acres

Scale: apprx. 1 cm = 8 chains

LEGEND	
x	Plots with dwarf mistletoe
o	Plots with no dwarf mistletoe
-	Understocked plots
- - -	Survey area boundary
—	Forest road

Fig. 3.--Plot distribution with an indication of dwarf mistletoe presence or absence; Cuba Ranger District.



144 plots
230 acres

Scale: apprx. 1 cm = 8 chains

LEGEND	
X	Plots with dwarf mistletoe
O	Plots with no dwarf mistletoe
-	Understocked plots
---	Survey area boundary
—	Forest road

Fig. 4.--Plot distribution with an indication of dwarf mistletoe presence or absence; Jemez Ranger District.

YIELDS PER ACRE OF SOUTHEASTERN PINE, STAND NUMBER 1.

SITE INDEX 89

THINNING INTENSITY-- INITIAL 120, SUBSEQUENT 120.

PALMDAS 34E CUBA RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ. FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU. FT.	MERCHANT- ABLE VOLUME CU. FT.	SAWTIMBER VOLUME BD. FT.	TREES NO.	BASAL AREA SQ. FT.	TOTAL VOLUME CU. FT.	MERCHANT- ABLE VOLUME CU. FT.	SAWTIMBER VOLUME BD. FT.
50	.3	560	79	5.1	57	1790	490	0					
50	.0	496	73	5.2	57	1640	490	0	64	6	150	0	0
60	.1	491	113	6.5	65	2690	1690	0					
70	.2	480	147	7.5	73	3810	2910	0					
80	.6	461	190	8.7	83	5790	4940	6100					
80	.0	259	117	9.1	84	3580	3110	4100	202	73	2210	1830	2000
90	.2	256	142	10.1	89	4730	4260	9700					
100	.3	256	169	11.0	94	5980	5450	17700					
110	.7	256	211	12.3	103	8270	7650	27800					
110	.0	134	120	12.8	104	4720	4580	16300	122	91	3550	3270	11500
120	.2	134	139	13.8	108	5700	5340	20900					
120	.0	36	48	15.7	110	2020	1920	8200	98	91	3680	3420	12700
130	.1	36	59	17.4	113	2570	2460	11300					
TOTAL YIELDS											12160	10980	37500

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 1500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 50., 27. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 1

YIELDS PER ACRE OF SOUTHWESTERN PUNDEROSA PINE, STAND NUMBER 1.

SITE INDEX 89

THINNING INTENSITY-- INITIAL= 120. SUBSEQUENT= 80.

PALMOAS SALE CUBA RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
50	.3	560	79	5.1	57	1790	490	0					
60	.7	553	120	6.3	65	2860	1650	0					
70	1.1	538	165	7.5	75	4380	3340	0					
70	.5	317	108	7.9	76	2870	2300	0	221	57	1510	1040	0
80	.9	313	135	8.9	83	4080	3520	4300					
90	1.3	306	160	9.8	88	5250	4680	9700					
100	2.1	295	198	11.1	98	7500	6660	22900					
100	1.2	105	80	11.8	99	2970	2730	9700	190	118	4330	3930	13200
110	1.9	104	97	13.1	103	3800	3540	13400					
120	2.6	99	109	14.2	107	4420	4160	16600					
120	1.4	22	32	16.3	109	1330	1260	5600	77	77	3090	2900	11000
130	1.8	22	40	18.2	113	1710	1640	7800					
TOTAL YIELDS											10640	9510	32000

MERCH. CU. FT. - TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. - TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED - 3.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 1500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 50., 27. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 89

THINNING INTENSITY-- INITIAL= 120. SUBSEQUENT= 100.

PALMOAS SALE CUBA RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

-12-

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
50	.3	560	79	5.1	57	1790	490	0					
50	.0	496	73	5.2	57	1640	490	0	64	6	150	0	0
60	.1	491	113	6.5	65	2690	1690	0					
70	.2	480	147	7.5	73	3810	2910	0					
80	.6	461	190	8.7	83	5790	4940	6100					
80	.0	208	98	9.3	84	3010	2640	3800	253	92	2780	2300	2300
90	.2	207	122	10.4	90	4070	3680	9200					
100	.3	207	147	11.4	95	5210	4770	17100					
110	.6	207	171	12.3	99	6380	5900	21500					
110	.0	112	100	12.8	100	3760	3500	13000	95	71	2620	2400	8500
120	.2	112	118	13.9	103	4620	4340	17100					
120	.0	29	39	15.8	105	1580	1500	6500	83	79	3040	2840	10600
130	.1	29	49	17.6	109	2030	1950	9000					
TOTAL YIELDS											10620	9490	30400

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.
 BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.
 INITIAL THINNING MUST BE FROM BELOW.
 DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.
 MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1, CUBIC FEET AND 1500, BOARD FEET.
 ALL THINNINGS MAY BE NONCOMMERCIAL.
 AT INITIAL AGE 50., 27, PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 3

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 39
THINNING INTENSITY-- INITIAL= 100, SUBSEQUENT= 120.

PALMOAS SALE CUBA RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
50	.3	560	79	5.1	37	1790	490	0					
50	.0	399	63	5.4	57	1410	490	0	161	16	380	0	0
60	.1	396	100	5.8	65	2360	1600	0					
70	.2	390	133	7.9	73	3420	2740	1100					
70	.0	306	110	8.1	74	2830	2310	1100	84	23	590	430	0
80	.1	302	136	9.1	80	4020	3500	4800					
90	.1	295	161	10.0	86	5150	4600	10400					
90	.0	207	120	10.3	87	3850	3480	8400	38	41	1300	1120	2000
100	.1	207	144	11.3	92	4950	4530	15700					
110	.1	207	168	12.2	96	6080	5610	20300					
110	.0	139	120	12.6	96	4370	4060	15000	68	48	1710	1550	3100
120	.1	139	140	13.6	100	5320	4970	19300					
120	.0	37	48	15.5	102	1880	1780	7600	102	92	3440	3190	11700
130	.1	37	59	17.1	105	2370	2270	10300					
TOTAL YIELDS											9790	8560	29300

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 1500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 50., 27. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 4

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 89

THINNING INTENSITY-- INITIAL= 120, SUBSEQUENT= 120.

PALMOAS SALE CUBA RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
50	.3	560	79	5.1	57	1790	490	0					
50	.0	496	73	5.2	57	1640	490	0	64	6	150	0	0
60	.1	491	113	6.5	65	2690	1690	0					
70	.2	480	147	7.5	73	3810	2910	0					
70	.0	322	107	7.8	74	2770	2190	0	156	40	1040	720	0
80	.1	318	134	8.8	80	3930	3370	3800					
90	.1	311	160	9.7	86	5090	4520	9000					
90	.0	220	120	10.0	87	3840	3430	7300	91	40	1250	1090	1700
100	.1	218	144	11.0	91	4930	4490	14200					
110	.1	218	168	11.9	96	6070	5590	19900					
110	.0	145	120	12.3	96	4340	4010	14600	73	48	1730	1580	5300
120	.1	145	140	13.3	100	5290	4940	18900					
120	.0	38	48	15.2	102	1850	1750	7300	107	92	3440	3190	11600
130	.1	38	59	16.9	105	2370	2270	10200					
TOTAL YIELDS											9980	8850	28800

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 1500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 50, 27. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 5

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 89

THINNING INTENSITY-- INITIAL= 120, SUBSEQUENT= 80.

PALMOAS SALE CUBA RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
50	.3	560	79	5.1	57	1790	490	0					
60	.7	553	120	6.5	65	2860	1650	0					
60	.2	392	93	6.6	65	2220	1430	0	161	27	640	220	0
70	.6	387	125	7.7	73	3240	2530	0					
80	1.0	378	152	8.6	80	4450	3770	3800					
90	1.8	364	191	9.8	90	6370	5670	12300					
90	.9	133	80	10.5	91	2700	2450	6100	231	111	3670	3220	6200
100	1.3	133	101	11.8	96	3640	3350	11900					
110	2.1	130	118	12.9	100	4470	4160	15600					
120	2.8	123	130	13.9	104	5110	4790	18900					
120	1.5	22	32	16.3	107	1290	1230	5400	101	98	3820	3560	13500
130	1.9	22	40	18.2	110	1660	1600	7600					
TOTAL YIELDS											9790	8600	27300

MERCH. CU. FT. - TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. - TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED - 3.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1, CUBIC FEET AND 1500, BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 50,, 27, PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 6

YIELDS PER ACRE OF SOUTHWESTERN PUNDEROSA PINE, STAND NUMBER 1.

SITE INDEX 76

THINNING INTENSITY-- INITIAL= 30. SUBSEQUENT= 100.

STABLE MESA UNIT ONE JEMEZ RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ. FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU. FT.	MERCHANT- ABLE VOLUME CU. FT.	SAWTIMBER VOLUME BD. FT.	TREES NO.	BASAL AREA SQ. FT.	TOTAL VOLUME CU. FT.	MERCHANT- ABLE VOLUME CU. FT.	SAWTIMBER VOLUME BD. FT.
40	.2	2947	154	3.1	37	3520	0	0					
40	.0	418	33	3.8	41	670	0	0	2529	121	2950	0	0
50	.1	416	69	5.5	50	1370	510	0					
60	.1	413	101	6.7	57	2130	1410	0					
60	.0	326	32	7.0	58	1720	1210	0	107	19	410	200	0
70	.1	304	109	8.1	65	2490	2030	900					
80	.1	300	133	9.0	71	3410	2950	3800					
80	.0	208	98	9.3	72	2540	2230	3200	92	35	870	720	600
90	.1	207	120	10.3	77	3390	3060	7400					
100	.1	207	142	11.2	81	4290	3910	13200					
100	.0	29	30	13.8	84	950	890	3500	178	112	3340	3020	9700
110	.1	29	38	15.6	88	1280	1220	5200					
120	.1	29	47	17.3	91	1640	1580	7200					
120	.0	7	14	19.2	93	500	480	2400	22	33	1140	1100	4800
130	.1	7	18	21.6	96	660	640	3500					
140	.1	7	22	23.9	99	830	810	4700					
TOTAL YIELDS											9540	5850	19800

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 40., 14. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 7

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 76

THINNING INTENSITY-- INITIAL= 80. SUBSEQUENT= 90.

STABLE MESA UNIT ONE JEMEZ RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUIS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT-ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT-ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
40	.2	2947	154	3.1	37	3620	0	0					
40	.0	418	33	3.8	41	670	0	0	2529	121	2950	0	0
50	.1	416	69	5.5	50	1370	510	0					
60	.1	413	101	6.7	57	2130	1410	0					
60	.0	275	73	7.0	58	1550	1090	0	138	28	580	320	0
70	.1	273	100	8.2	65	2290	1890	1000					
80	.1	270	125	9.2	71	3220	2810	4000					
80	.0	178	89	9.6	72	2330	2060	3500	92	36	890	750	500
90	.1	177	108	10.6	77	3080	2740	7400					
100	.1	177	128	11.5	81	3880	3550	12900					
100	.0	25	27	14.2	85	870	820	3300	152	101	3010	2730	9600
110	.1	25	35	16.1	88	1180	1130	4900					
120	.1	25	43	17.8	92	1510	1450	6800					
120	.0	6	13	19.7	94	450	440	2200	19	30	1060	1010	4600
130	.1	6	16	22.2	97	600	580	3200					
140	.1	6	20	24.5	99	750	730	4400					
TOTAL YIELDS											9240	5540	19100

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.

MINIMUM CUIS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 40., 14. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITF INDEX 76

THINNING INTENSITY-- INITIAL= 90. SUBSEQUENT= 90.

STABLE MESA UNIT ONE JEMEZ RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
40	.2	2947	154	3.1	37	3620	0	0					
40	.0	470	37	3.8	40	750	0	0	2477	117	2870	0	0
50	.1	467	74	5.4	50	1480	520	0					
60	.1	462	106	6.5	57	2250	1420	0					
60	.0	280	73	6.9	58	1540	1060	0	182	33	710	360	0
70	.1	278	49	8.1	65	2280	1860	800					
80	.1	275	124	9.1	71	3200	2780	5700					
80	.0	181	89	9.5	72	2320	2050	3200	94	35	880	730	500
90	.1	180	108	10.5	77	3070	2780	7100					
100	.1	180	128	11.4	81	3870	3540	12500					
100	.0	25	27	14.0	84	850	800	3100	155	101	3020	2740	9400
110	.1	25	34	15.9	88	1150	1090	4700					
120	.1	25	43	17.7	92	1490	1430	6700					
120	.0	6	13	19.6	94	450	430	2200	19	30	1040	1000	4500
130	.1	6	16	22.1	96	590	580	3200					
140	.1	6	19	24.4	99	740	730	4300					
TOTAL YIELDS											9260	5560	18700

MERCH. CU. FT. - TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. - TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED - 3.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 40., 14. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 9

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 76

THINNING INTENSITY-- INITIAL= 90. SUBSEQUENT= 100.

STABLE MESA UNIT ONE JEMEZ RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT-ABLE VOLUME CU.FT.	SANTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT-ABLE VOLUME CU.FT.	SANTIMBER VOLUME BD.FT.
40	.2	2947	154	3.1	37	3620	0	0					
40	.0	470	37	3.8	40	750	0	0	2477	117	2870	0	0
50	.1	467	74	5.4	50	1480	520	0					
60	.1	462	106	6.5	57	2250	1420	0					
60	.0	316	80	6.8	58	1680	1140	0	146	26	570	280	0
70	.1	314	107	7.9	65	2450	1960	0					
80	.1	310	131	8.8	71	3350	2870	3200					
80	.0	216	98	9.1	72	2510	2190	2800	94	33	840	680	400
90	.1	215	120	10.1	77	3370	3030	6700					
100	.1	215	142	11.0	81	4280	3900	12400					
100	.0	29	30	13.7	84	940	880	3400	186	112	3340	3020	9000
110	.1	29	38	15.5	88	1270	1200	5100					
120	.1	29	47	17.2	91	1620	1560	7100					
120	.0	8	16	19.1	93	570	550	2700	21	31	1050	1010	4400
130	.1	8	20	21.4	96	740	720	3800					
140	.1	8	24	23.6	99	920	900	5200					
TOTAL YIELDS											9590	5890	18600

MERCH. CU. FT. - TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. - TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED - 3.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CURIC FEET AND 500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 40, 14. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 10

YIELDS PER ACRE OF SOUTHWESTERN PUNDEROSA PINE, STAND NUMBER 1.

SITE INDEX 76

THINNING INTENSITY-- INITIAL= 80. SUBSEQUENT= 100.

STABLE MESA UNIT ONE JEMEZ RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
40	.2	2947	154	3.1	37	3620	0	0					
40	.0	418	33	3.8	41	670	0	0	2529	121	2950	0	0
50	.1	416	69	5.5	50	1370	510	0					
60	.1	413	101	6.7	57	2130	1410	0					
70	.6	407	128	7.6	64	2950	2280	0					
70	.0	264	90	7.9	65	2070	1660	0	143	38	880	620	0
80	.4	262	113	8.9	71	2900	2500	2900					
90	.9	259	136	9.8	76	3810	3390	6800					
100	1.3	255	156	10.6	81	4690	4250	12000					
100	.0	31	30	13.3	84	940	880	3400	224	126	3750	3370	8600
110	.2	31	39	15.1	88	1280	1210	5000					
120	.4	31	48	16.8	91	1650	1580	7100					
120	.0	8	15	18.8	93	550	530	2600	23	33	1100	1050	4500
130	.2	8	19	21.1	96	710	690	3700					
140	.2	8	24	23.3	99	900	880	5000					
TOTAL YIELDS											9580	5920	18100

MERCHANT. CU. FT. - TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. - TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED - 5.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 40,, 14. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

YIELDS PER ACRE OF SOUTHWESTERN PUNDEROSA PINE, STAND NUMBER 1.

SITE INDEX 76

THINNING INTENSITY-- INITIAL= 100, SUBSEQUENT= 100.

STABLE MESA UNIT ONE JEMEZ RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT-ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT-ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
40	.2	2947	154	3.1	37	3620	0	0					
40	.0	532	40	3.7	40	820	0	0	2415	114	2800	0	0
50	.1	529	78	5.2	50	1580	470	0					
60	.1	523	113	6.3	57	2410	1390	0					
60	.0	321	79	6.7	58	1670	1100	0	202	34	740	290	0
70	.1	318	106	7.8	65	2430	1920	0					
80	.1	314	130	8.7	71	3310	2820	2900					
80	.0	100	49	9.5	72	1270	1120	1600	214	81	2040	1700	1300
90	.1	99	65	11.0	77	1850	1680	4900					
100	.1	99	82	12.3	81	2480	2290	8300					
100	.0	22	25	14.4	84	780	740	3000	77	57	1700	1550	5300
110	.1	22	32	16.4	87	1070	1020	4500					
120	.1	22	40	18.2	91	1370	1320	6300					
TOTAL YIELDS											8650	4860	12900

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.

BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.

INITIAL THINNING MUST BE FROM BELOW.

DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 5.0.

MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 500. BOARD FEET.

ALL THINNINGS MAY BE NONCOMMERCIAL.

AT INITIAL AGE 40,, 14. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 12

YIELDS PER ACRE OF SOUTHWESTERN PONDEROSA PINE, STAND NUMBER 1.

SITE INDEX 76

THINNING INTENSITY-- INITIAL= 90. SUBSEQUENT= 100.

STABLE MESA UNIT ONE JEMEZ RD BEFORE THINNING 1975 SURVEY

CHARACTERISTICS BEFORE AND AFTER THINNING

PERIODIC INTERMEDIATE CUTS

STAND AGE (YEARS)	DMR	TREES NO.	BASAL AREA SQ.FT.	AVERAGE D.B.H. IN.	AVERAGE HEIGHT FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.	TREES NO.	BASAL AREA SQ.FT.	TOTAL VOLUME CU.FT.	MERCHANT- ABLE VOLUME CU.FT.	SAWTIMBER VOLUME BD.FT.
40	.2	2947	154	3.1	37	3620	0	0					
40	.0	470	37	3.8	40	750	0	0	2477	117	2870	0	0
50	.1	467	74	5.4	50	1480	520	0					
60	.1	462	106	6.5	57	2250	1420	0					
60	.0	316	80	6.8	58	1680	1140	0	146	26	970	280	0
70	.1	314	107	7.9	65	2450	1960	0					
80	.1	310	131	8.8	71	3350	2870	3200					
80	.0	99	50	9.6	72	1280	1140	1800	211	81	2070	1730	1400
90	.1	98	65	11.0	77	1830	1670	4900					
100	.1	98	81	12.3	81	2450	2270	8200					
100	.0	22	25	14.3	84	770	720	2900	76	56	1680	1550	5300
110	.1	22	32	16.3	87	1050	1010	4400					
120	.1	22	39	18.1	91	1360	1300	6200					
TOTAL YIELDS											8550	4860	12900

MERCH. CU. FT. = TREES 6.0 INCHES D.B.H. AND LARGER TO 4.0-INCH TOP.
 BD. FT. = TREES 10.0 INCHES D.B.H. AND LARGER TO VARIABLE TOP LIMIT.
 INITIAL THINNING MUST BE FROM BELOW.
 DWARF MISTLETOE RATING ABOVE WHICH PERIODIC THINNINGS WILL NOT BE EXECUTED = 3.0.
 MINIMUM CUTS FOR INCLUSION IN TOTAL YIELDS-- 1. CUBIC FEET AND 500. BOARD FEET.
 ALL THINNINGS MAY BE NONCOMMERCIAL.
 AT INITIAL AGE 40., 14. PERCENT OF THE TREES WERE INFECTED WITH DWARF MISTLETOE.

Table 13